REPORT NO. EVT 18-87

STATIC PULL TEST OF TIEDOWN ANCHORS ON M127 12-TON STAKE SEMITRAILER

US ARMY
ARMAMENT
MUNITIONS
CHEMICAL COMMAND

US ARMY DEFENSE AMMUNITION
CENTER AND SCHOOL

EVALUATION DIVISION
SAVANNA, ILLINOIS 61074-9639

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER EVT 18-87	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Static Pull Test of Tiedown Anchors on M127, 12-Ton Stake Semitrailer		5. TYPE OF REPORT & PERIOD COVERED FINAL 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Mr. Jerome Krohn		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS U.S. Army Defense Ammunition Center and School ATTN: SMCAC-DEV Savanna, IL 61074-9636		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS U.S. Army Armament, Munitions and Chemical Command ATTN: AMSMC-MAY-PB(D) Picatinny Arsenal, NJ 07806-5000		12. REPORT DATE July 1987 13. NUMBER OF PAGES
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) UNCLASSIFIED 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

UNLIMITED

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The U.S. Army Defense Ammunition Center and School (USADACS) was requested by 3d Battalion, 9th Field Artillery, Fort Sill, OK, thru the U.S. Army Armament, Munitions and Chemical Command (AMCCOM), to evaluate the tiedown anchors on the M127, 12-ton semitrailer. The Fort Sill unit has been assigned an exercise which includes tying down of the PERSHING II, weighing almost 15,000 pounds, on the M127 semitrailer. The Fort Sill unit requested the 5,000-pound capacity tiedown fitting be pull-tested to verify its load rating. (cont)

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

20. (cont)

The tiedown anchor "modification kit" (FSN 2510-00-134-1130) was ordered and installed on the M127 5-ton semitrailer. Using a dynamometer to measure the pull, a static pull of 5,000 pounds was exerted in a lateral, longitudinal, vertical and 45 degree direction off the tiedown anchor. The tiedown anchor restrained the applied loads without yielding or sustaining any damage.

STATIC PULL TEST OF TIEDOWN ANCHORS

ON M127, 12-TON STAKE SEMITRAILER

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Savanna, IL 61074-9639

ABSTRACT

The U.S. Army Defense Ammunition Center and School (USADACS) was requested by 3d Battalion, 9th Field Artillery, Fort Sill, OK, thru the U.S. Army Armament, Munitions and Chemical Command (AMCCOM), to evaluate the tiedown anchors on the M127, 12-ton semitrailer. The Fort Sill unit has been assigned an exercise which includes tying down of the PERSHING II, weighing almost 15,000 pounds, on the M127 semitrailer. The Fort Sill unit requested the 5,000-pound capacity tiedown fitting be pull-tested to verify its load rating.

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STATIC PULL TEST OF TIEDOWN ANCHORS ON M127, 12-TON STAKE SEMITRAILER

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PART I

GENERAL

A. INTRODUCTION.

The Fort Sill unit has been assigned an exercise that includes tying down and movement of the PERSHING II first stage propulsion section, weighing almost 15,000 pounds. The item is to be moved on the M127, 12-ton stake semitrailer with tiedown anchors installed.

The U.S. Army Defense Ammunition Center and School (USADACS) performed static pull tests on the tiedown anchors installed on the M127. A static pull of 5,000 pounds was administered to the fitting in a longitudinal, lateral, vertical, and a 45 degree direction.

B. AUTHORITY.

Testing has been accomplished in accordance with mission responsibilities delegated by the U.S. Army Armament, Munitions and Chemical Command (AMCCOM). Reference is made to the following:

1. Change 4, 4 October 1974, to AR 740-1, 23 April 1971, Storage and Supply Activity Operations.

2. AMCCOM-R 10-17, 13 January 1986, Mission and Major Functions of USADACS.

3. Telephone request from 3d Battalion, 9th Field Artillery, Fort Sill, OK.

C. OBJECTIVE.

Based on the static pull tests performed on the tiedown anchors of the M127, it was determined the static pull of 5,000 pounds does not exceed the 5,000-pound rated capacity and is acceptable. The static pull of 5,000 pounds applied in a lateral, longitudinal, vertical and 45 degree direction

off the tiedown anchor on the M127, 12-ton stake semitrailer created no damage or permanent deformation.

E. RECOMMENDATIONS.

The "modification kit" (NSN 2510-00-134-1130) supplies 48 tiedown anchors for the M127, 12-ton stake semitrailer. Based on the pull tests performed, no problems were experienced with the tiedown anchors and a rated capacity of 5,000 pounds per tiedown anchor is acceptable. Recommend Drawing 19-48-8157-GM17PRI, covering procedures for PERSHING II first stage propulsion section M-275 in metal container, remain as published.

PART II

ATTENDEES

STATIC PULL TEST, 29 MAY 1987

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PART III

TEST PROCEDURES

STATIC PULL TEST

In performing the static pull test on a tiedown assembly, a predetermined force is applied to the securement device. The predetermined force, after application to the tiedown assembly, must be held at a predetermined force for a period of time.

In preparation for the static pull tests on the tiedown anchors on the M127 semitrailer, the modification kit which includes 48 tiedown anchors and frame reinforcing parts were installed on an M127 semitrailer by the USADACS Pilot Model Shop.

An arbitrary tiedown anchor was selected for testing. A 50,000-pound capacity dynamometer with a 10-inch diameter direct-read dial provided the force being applied. The dynamometer was connected to the M127 semitrailer tiedown anchor with a clevis. The opposite end of the dynamometer was secured to the 10,000-pound rough terrain forklift with a steel chain assembly. The hydraulic lifting cylinders of the 10,000-pound forklift were utilized to apply and maintain the 5,000-pound test load to the tiedown anchors. The 5,000-pound load was maintained for a period of three minutes before releasing.

The direction of force is relative to the longitudinal axis of the M127 semitrailer. The 5,000-pound pulls accomplished were a lateral, longitudinal, vertical, and 45 degree (inward and upward) from the tiedown anchor.

The load was applied in a slow, steady rate until the 5,000-pound load requirement was met. The tiedown anchor and the affected M127 semitrailer structural members were being constantly inspected and the data collected. These data are recorded in PART IV, following.

PART IV

TEST DATA

SYNOPSIS OF TEST

STATIC PULL TEST

Static pull tests of 5,000 pounds were performed on a tiedown anchor on the M127 stake semitrailer. The 5,000-pound force was applied in a lateral, longitudinal, vertical, and 45 degree directional pull inward and upward relative to the tiedown anchor. Tension was maintained at 5,000 pounds for a period of three minutes.

Inspection during and following each directional pull showed no permanent deformation or damage as a result of the test.

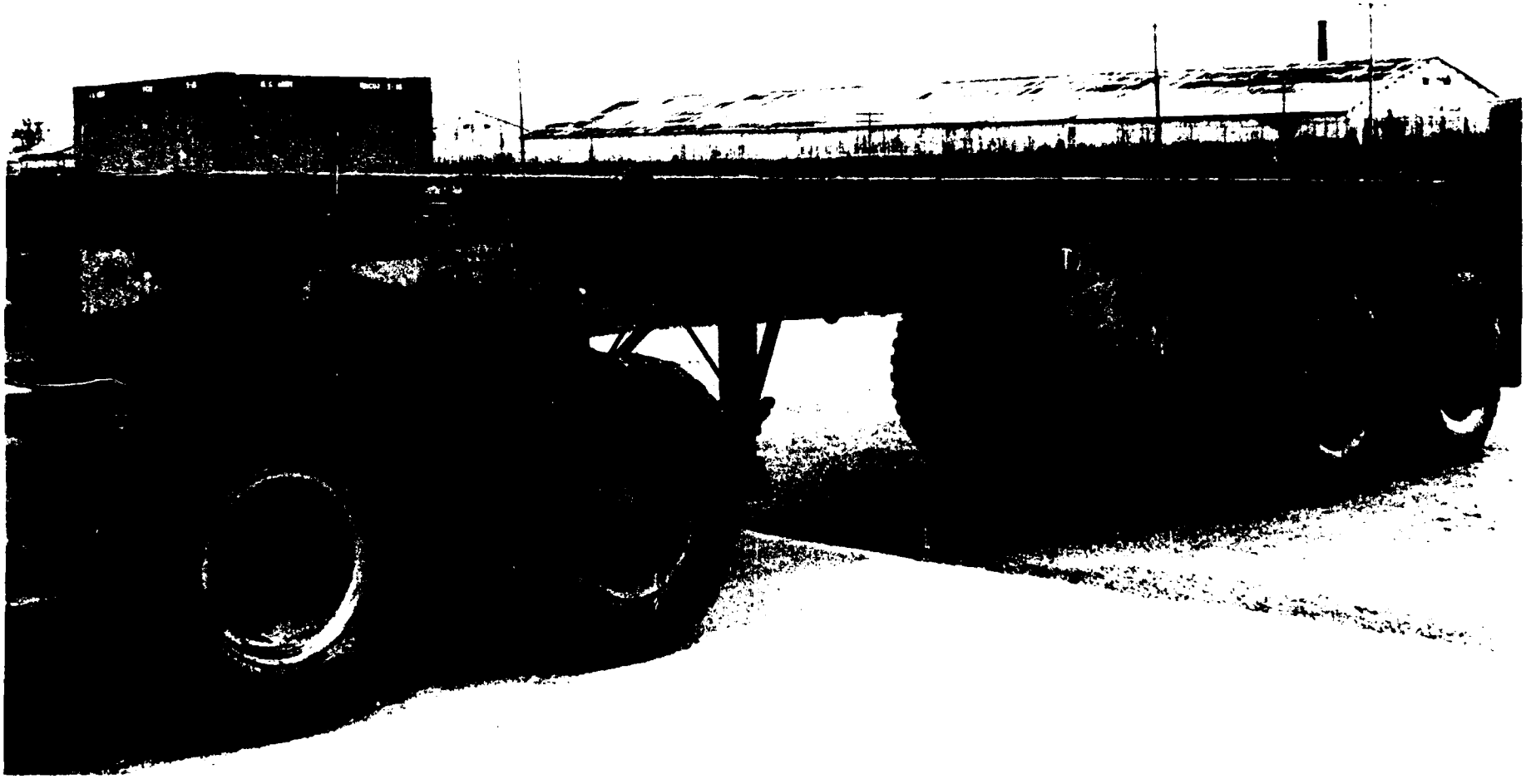

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Photo No. 1. View of M127, 12-ton stake semitrailer.

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Photo No. 2. View of M127 with tiedown anchors installed.		

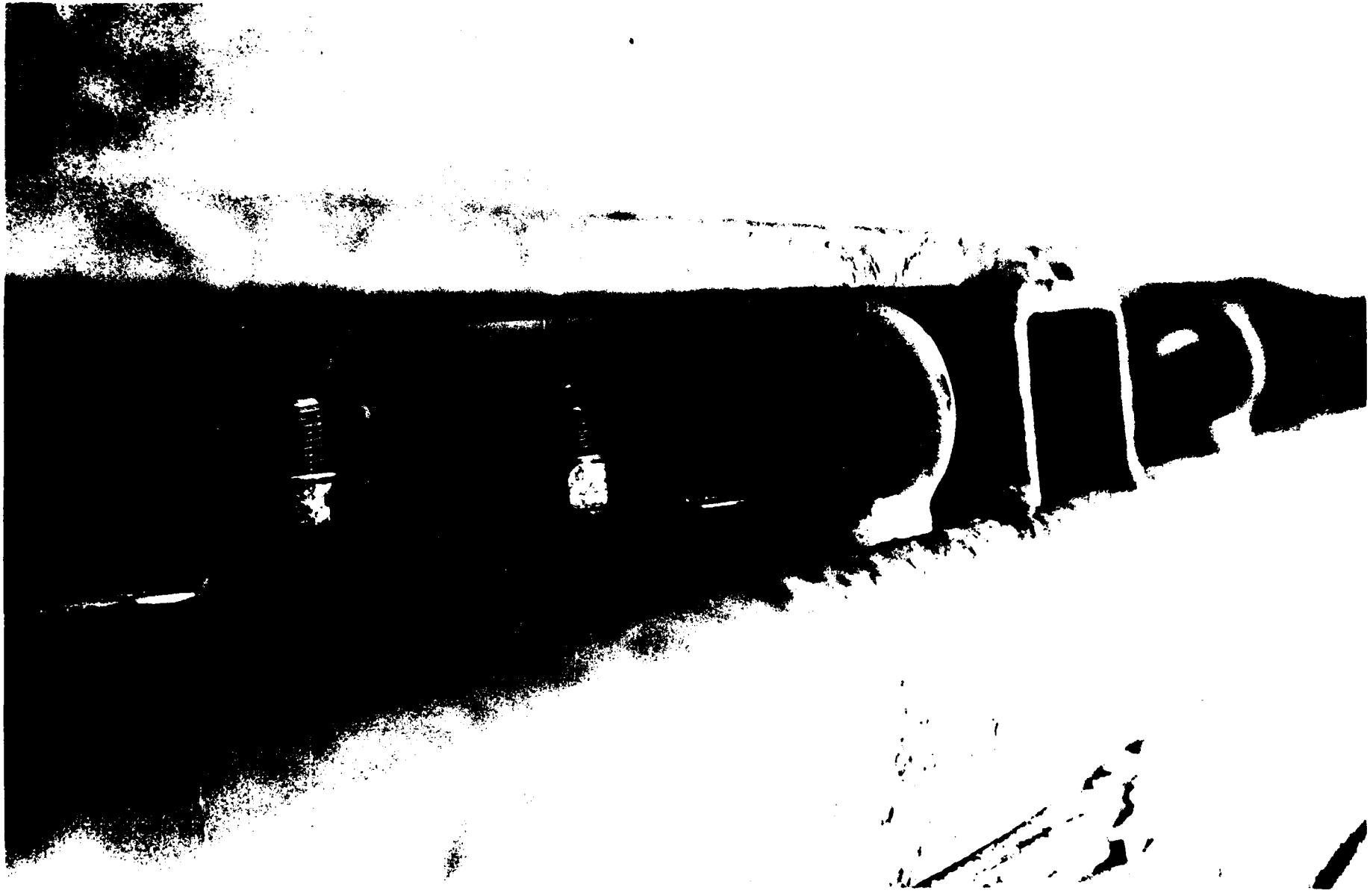

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Photo No. 3. View of a tie-down installed on M127.

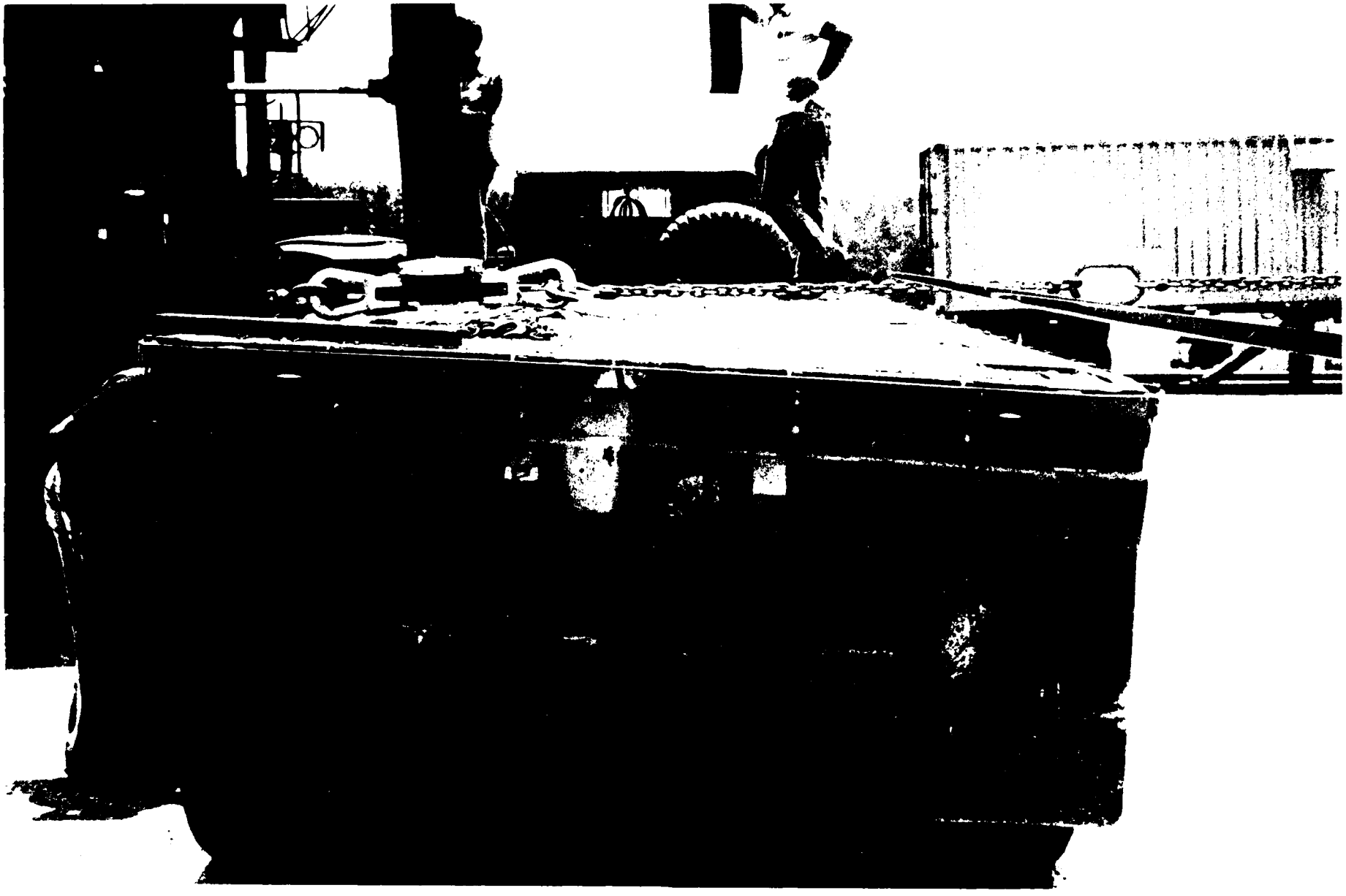

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Photo No. 4. View of 5,000-pound static pull on tiedown anchor in lateral direction.

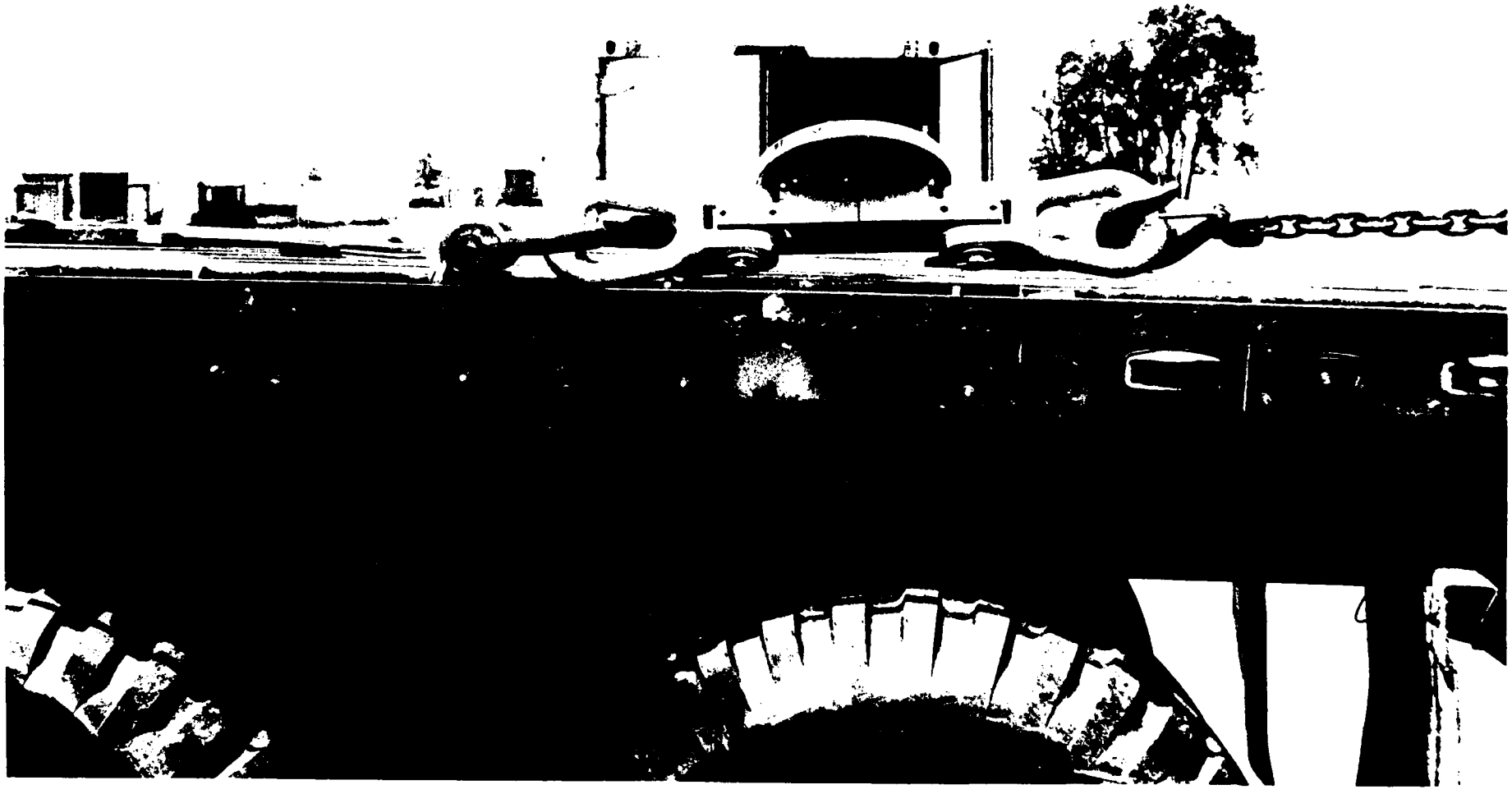

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Photo No. 5. View of 5,000-pound static pull on tiedown anchor in a longitudinal direction.

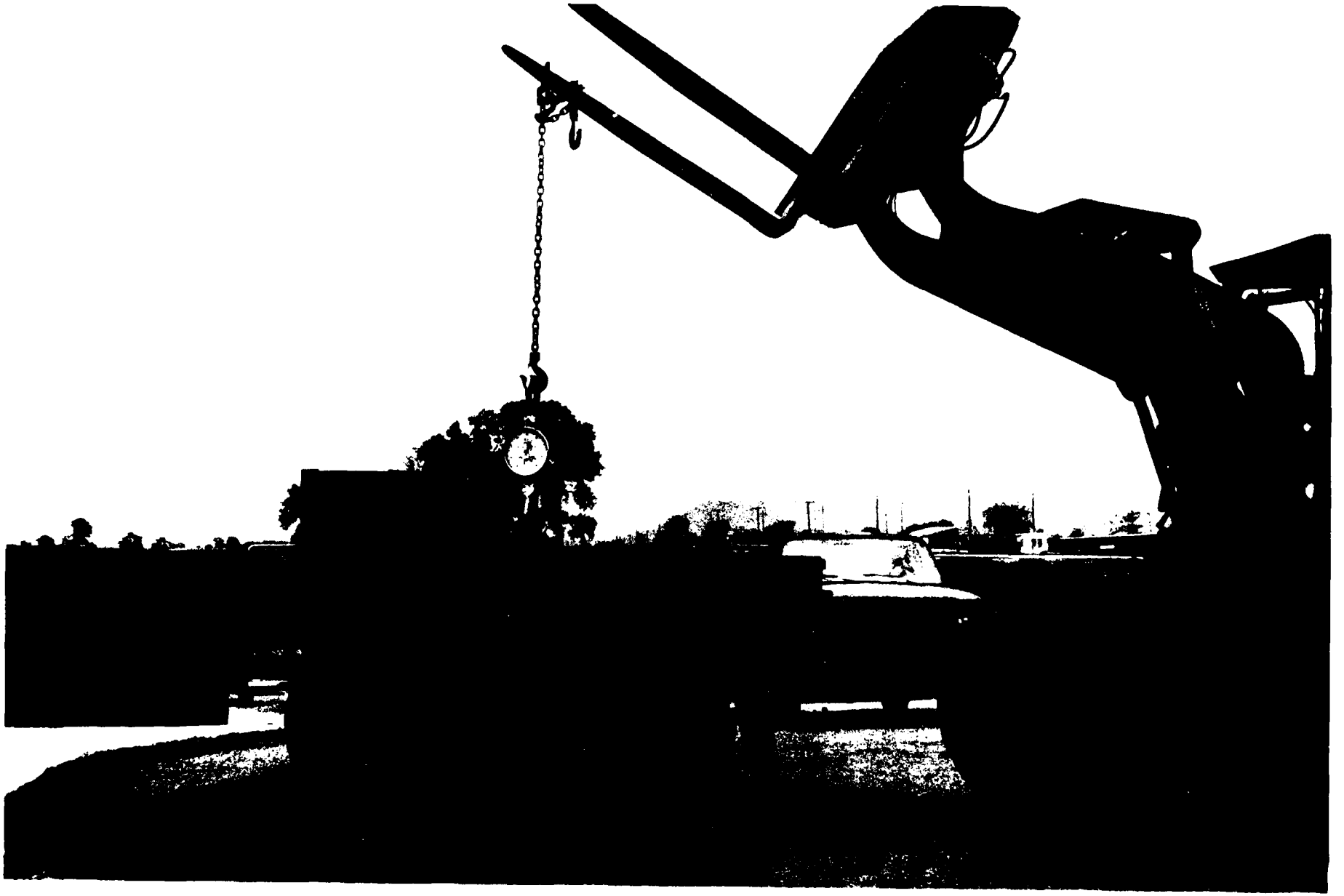

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Photo No. 6. View of 5,000-pound static pull on tiedown anchor in a vertical direction.

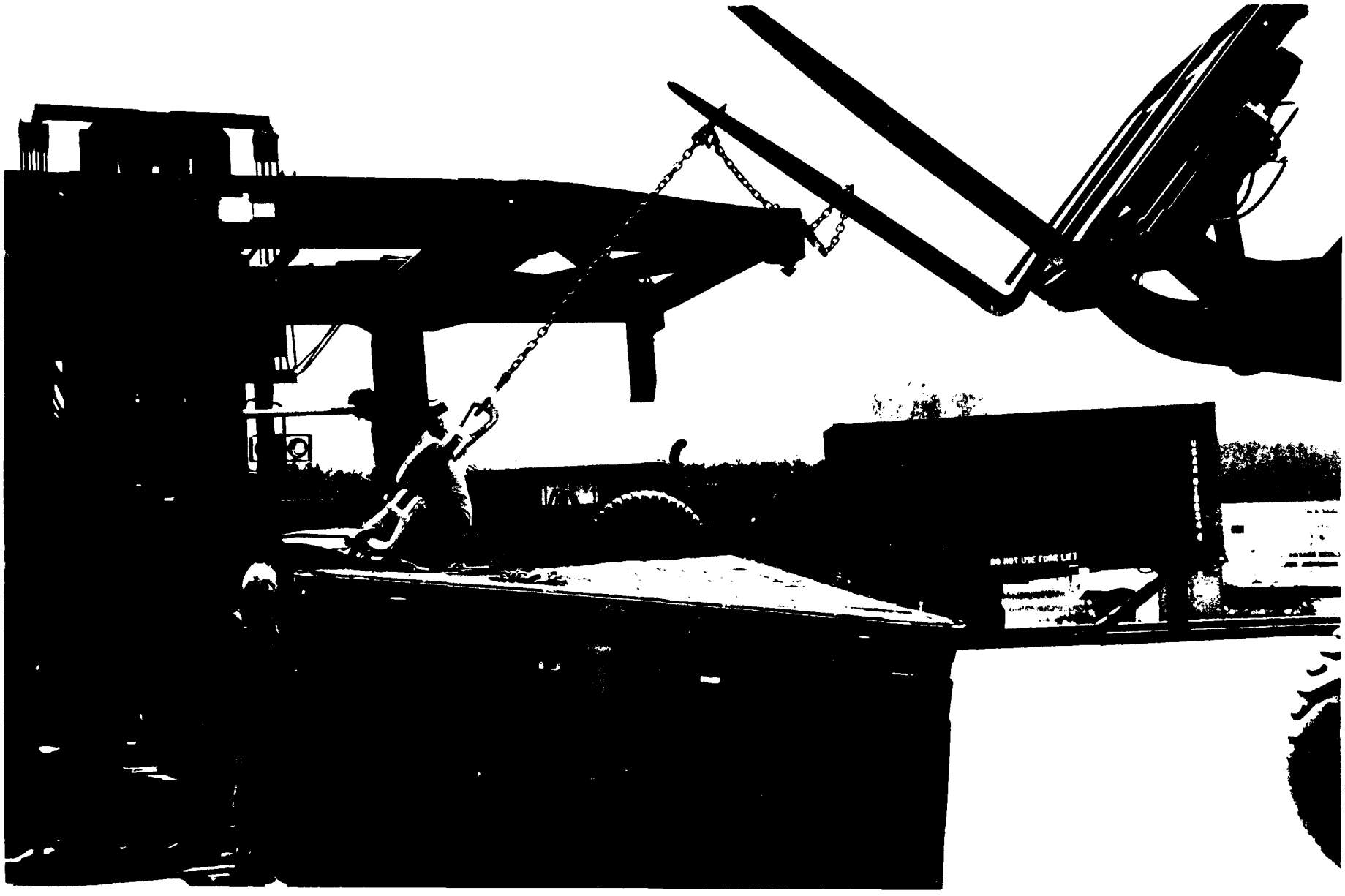

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Photo No. 7. View of 5,000-pound static pull on a tiedown anchor in a 45 degree direction.